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EXAMINER

YAM, STEPHEN K

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 06/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/837,871

Applicant(s)

PRICE, JEFFREY H.

Examiner

Stephen Yam

Art Unit

2878

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it contains the title in the heading of the abstract. Correction is required. See MPEP § 608.01(b).

Claim Objections

2. The term "focussed" on line 2 of Claim 1 and lines 1 and 3 of Claim 9 is a typographical error- the correct spelling is "focused".
3. The term "position" on line 2 of Claim 20 incorporates incorrect grammar- the correct associated grammatical term is "positioned".
4. The term "display" on line 2 of Claim 20 incorporates incorrect grammar- the correct associated grammatical term is "displaying".

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. On line 4, the light selection optics is claimed as positioned between the plurality of detectors and the sample volume, implying the light selection optics is physically located between the detectors and sample volume, as opposed to positioned between the detectors and the sample volume along the optical path of the system. Fig. 1A shows the light selection optics positioned in a manner such that it does not reside between the detectors and sample volume

Art Unit: 2878

physically, but rather along the optical path B. The claim should be revised to indicate the positioning of the light selection optics in relation to the optical path as opposed to a physical sense.

7. Claims 4 and 8 recite the limitation "ON regions". There is insufficient antecedent basis for this limitation in the claim.

8. Claims 4 and 8 recite the limitation "OFF regions". There is insufficient antecedent basis for this limitation in the claim.

9. Claim 6 recites the limitation "ON and OFF regions" in line 1. There is insufficient antecedent basis for this limitation in the claim.

10. Claims 6 and 7 recite the limitation "degree of confocality". There is insufficient antecedent basis for this limitation in the claim.

11. Claim 10 recites the limitation "different depths" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

12. Claims 11 and 13 recite the limitation "focus differentiation optics". There is insufficient antecedent basis for this limitation in the claim.

13. Claims 15, 16, 19, and 25 recite the limitation "sample". There is insufficient antecedent basis for this limitation in the claim.

14. Claim 23 recites the limitation "ratio of intensity of light" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

15. Claims 28 and 29 recite the limitation "processing system". There is insufficient antecedent basis for this limitation in the claim.

Art Unit: 2878

16. Claim 28 recites the limitation "3D image". There is insufficient antecedent basis for this limitation in the claim.

17. Claim 29 recites the limitation "objects" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

19. Claims 1-2, 4-10, 12, 16-17, and 26 are rejected under 35 U.S.C. 102(b) as being unpatentable by Campanelli et al. US Patent No. 6,024,283.

Regarding Claims 1, 21, and 24, Campanelli et al. teach a bar code reader comprising: a) an array of groups of reading elements, each group having an associated predetermined operating focal distance (see col.8, lines 32-33); and b) an array of selectable DMD elements disposed adjacent to said array of reading elements (see col.8, lines 34-35) to transmit selected light to the reading elements.

Regarding Claims 2, 4 and 8, it is inherent that DMD elements are electrically controlled mirrors that are controllably switched to ON and OFF positions. Each DMD element is individually controlled to adjust the pitch of the mirror, to selectively transmit or block incident light, and that switching between ON and OFF will respectively transmit or block the light to the reading elements (see col.8, lines 38-42).

Regarding Claim 5-7, the DMD elements concurrently control the degree of confocality to all reading elements, by selectively activating/deactivating the DMD elements associated with each reading element with a distinct focal plane.

Regarding Claim 9, Campanelli et al. teach an array of groups of reading elements (see col.8, line 31-32. It is inherent that a bar code reader comprises an array of detectors, each detector assigned to a specific region of the bar code. Therefore, each element in the array of groups of reading elements is focused on a different region of the sample, with the DMD elements selecting the portions of each region transmitted to each detector.

Regarding Claim 10, Campanelli et al. disclose an array of lenses (35) to create a sequence of beams focused at different planes (see col.8, lines 24-26) for each detector.

Regarding Claim 12, Campanelli et al. show in Fig. 3c that each detector on the detector array (36) is equidistant from the associated lens on the array of lenses (35).

Regarding Claim 16, Campanelli et al. teach a light source (10) in Fig. 3c to illuminate the bar code (37) and capture the reflected light at the detectors (36).

Regarding Claim 17, Campanelli et al. disclose a lens (38) in Fig. 3c between the array of lenses (35) and the detector (36) on the optical path, to relay light waves.

Regarding Claim 22, it is inherent that a detector captures data using time-delay-and-integration methods, with a capacitive element to accumulate and store data over a short delay of time.

Regarding Claim 23, it is inherent that a DMD element contains analog control to further increase or decrease the amount of transmitted light, increasing the contrast of the detectors for an associated focal plane.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 3, 11, 13-15, and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Campanelli et al.

Regarding Claim 3, Campanelli et al. disclose a laser light source (10) to illuminate the bar code. Campanelli et al. does not disclose the laser emitting a pulsed pattern, or providing multiphoton fluorescence. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the laser of Campanelli et al. in a pulse pattern due to design choice, and to provide multiphoton fluorescence to provide a greater resolution due to detecting varying wavelengths of light.

Regarding Claims 11 and 13-14, Campanelli et al. teach an array of lenses (35) to focus each detector to a distinct focal length. Campanelli et al. does not teach the ability to adjust each lens in the array of lenses, or the specific construction of the array of lenses. It is obvious to adjust the focal length for a lens by movement of the lens in the direction of the optical path. It is a design choice to contain at least one first side and a plurality of second sides, where each second side is positioned at a different distance from the at least one first side, and each second side is substantially parallel to one of the at least one first side. Therefore, it would have been

Art Unit: 2878

obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Campanelli et al. with the ability to move the array of lenses in the direction of the optical path, and with at least one first side and a plurality of second sides, to adjust the focal length through differing lens thickness and position.

Regarding Claim 15, Campanelli et al. disclose a plurality of reading elements and a plurality of DMD elements to transmit or block selected light. Campanelli et al. do not disclose a light source causing fluorescence within a dye. It is common knowledge that sections of a bar code will fluoresce with incident light, due to the printing dyes of the barcode. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a light source and optics to illuminate the barcode, to accurately image the fluorescence transmitted by sections of the barcode.

Regarding Claim 18, Campanelli et al. disclose a plurality of reading elements and a plurality of DMD elements to transmit or block selected light. Campanelli et al. do not disclose magnification adjustment optics to compensate for differences in magnification from each detector. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include magnification adjustment optics in the device of Campanelli et al., to correct magnification aberrations for high-accuracy detection.

22. Claims 19 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campanelli et al. in view of Litsche et al. US Patent No. 5,838,538.

Regarding Claims 19 and 25, Campanelli et al. disclose a plurality of reading elements and a plurality of DMD elements to transmit or block selected light. Campanelli et al. do not

Art Unit: 2878

teach a sample fixture for holding and scanning the sample. Litsche et al. disclose a barcode-scanning apparatus with a holding device (see col. 1, line 53-54) and a first and second drive motor (see col. 1, lines 58-60) to move a barcode across a scanning device (see col. 1, lines 61-63). It would have been obvious to modify the device of Campanelli et al. with the holding device and scanning drive elements of Litsche et al., to provide the ability to read multiple linear barcodes (col. 1, lines 44-45 and 48-51).

23. Claims 20 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campanelli et al. in view of Ni US Patent No. 6,382,510.

Regarding Claims 20 and 27, Campanelli et al. disclose a plurality of reading elements and a plurality of DMD elements to transmit or block selected light. Campanelli et al. do not disclose a processing system for processing and displaying of outputs as a three-dimensional image. Ni teaches an apparatus to inspect a three-dimensional object having a barcode, by producing three-dimensional images of the inspected object (see col. 1, lines 63-65). Regarding Claim 20, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the elements of Campanelli et al. with the three-dimensional scanning abilities of Ni to provide means for processing and displaying a three-dimensional image, to locate and subsequently scan and process the barcode. Regarding Claim 27, it would have been obvious to one of ordinary skill in the art at the time the invention was made to filter the detector output from the modified elements of Campanelli et al. in view of Ni, to discard extraneous information retrieved from the three-dimensional scanning.

Art Unit: 2878

Regarding Claim 28, Campanelli et al. disclose a plurality of reading elements and a plurality of DMD elements to transmit or block selected light. Campanelli et al. do not disclose the segmenting of a 3D image into 3D objects. Ni teaches a processing device (14) in Fig. 1 to process the retrieved images and segment them (102) in Fig. 2 to be separately processed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the processing system in the modified invention of Campanelli et al. in view of Ni to segment the 3D image into 3D objects, so that each segment is separately processed to localize the barcode (108), as seen in Fig. 2.

Regarding Claim 29, Campanelli et al. teach a plurality of reading elements and a plurality of DMD elements to transmit or block selected light. Campanelli et al. do not teach the classification of objects into types based on measurement processing. Ni teaches the comparison of the inspected object image with a reference object image (112) on Fig. 2, and also teaches image recognition (Col. 1, lines 26-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Campanelli et al. with the comparison methods of Ni to utilize the processing system to classify the 3D objects into types, to recognize and adapt to each object type, as described by Ni (col. 2, lines 3-6).

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2878

Jovin et al., US Patent No. 6,128,077, teaches a confocal spectral imaging system with a micromirror to adjust the field of focus of a sample.

Kusaka, US Patent No. 5,485,001, teaches a focus detecting apparatus that detects the focus at a plurality of areas on a sample.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (703)308-4881. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7724 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

SY *SY*
May 21, 2002

Kevin Pyo
Kevin Pyo
Primary Examiner